

NON-PUBLIC?: N  
ACCESSION #: 9205280162  
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Washington Nuclear Plant - Unit 2 PAGE: 1 OF 5

DOCKET NUMBER: 05000397

TITLE: REACTOR CORE ISOLATION COOLING SYSTEM NOT ADEQUATELY  
TRANSFERABLE  
TO THE REMOTE SHUTDOWN PANEL  
EVENT DATE: 04/24/92 LER #: 92-016-00 REPORT DATE: 05/21/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 5 POWER LEVEL: 000

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR  
SECTION:  
50.73(a)(2)(v)

LICENSEE CONTACT FOR THIS LER:  
NAME: D. A. Swank, Compliance Engineer TELEPHONE: (509) 377-4451

COMPONENT FAILURE DESCRIPTION:  
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:  
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

#### ABSTRACT:

During a review of the Reactor Core Isolation Cooling System (RCIC) it was determined that the 48 VDC power supply for the RCIC turbine controls, and the position signal for the RCIC turbine steam inlet valve were not transferred out of the main Control Room (CR) when control of RCIC was transferred to the remote shutdown panel (RSP). These signals are required to be transferred to the RSP due to a postulated CR flood. The Plant was in a refueling condition and RCIC was not required at the time this condition was discovered.

The root cause of this event was misapplication of design inputs in that the transfer requirements were not properly implemented. The 48 VDC power supply for the RCIC control system, and the position signal for valve RCIC-V-45, will be modified so that they are transferred from the CR to the RSP, along with the other RCIC controls, w

en RCIC transfer to  
the RSP is made.

Flooding in the CR and subsequent cable shorting are extremely low probability events. This event did not impact the operation of RCIC from the CR. Even if RCIC were lost due to a CR flood, however, the low pressure emergency core cooling systems would have been available and controllable from outside the CR to safely shutdown the Plant. This event had no safety significance.

There were no structures, systems, or components inoperable prior to the start of this event that contributed to the event.

END OF ABSTRACT

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Plant Conditions

Power Level - 0%

Plant Mode - 5 (Refueling)

Event Description

On April 22, 1992, during a review of the Reactor Core Isolation Cooling System (RCIC) a Supply System Engineer determined that the 48 VDC power supply for the RCIC turbine controls was not transferred out of the main Control Room when control of RCIC was transferred to the remote shutdown panel (RSP). The WNP-2 RCIC design, as stated in FSAR section 7.4.1.4, includes transfer of all necessary power supplies and control logic to the RSP when the CR must be evacuated. On April 24, 1992, this event was determined to be reportable and a verbal notification to the NRC was made. This condition did not affect RCIC operation from the CR.

Immediate Corrective Action

Since the Plant was shut down at the time this determination was made and RCIC was not required to be operable, no immediate corrective action was required.

Further Evaluation and Corrective Action

A. Further Evaluation

RCIC is a high pressure injection system where the pump is driven by a steam turbine. Steam for the turbine is supplied from the Main

Steam System. The RCIC pump supplies water to the reactor taking suction from either the safety grade suppression pool or the nonsafety grade condensate storage tank. The RCIC components other than the steam driven turbine are powered from DC busses. RCIC is thus capable of maintaining reactor water level within a given range post scram, even during a loss of all AC power event.

The Supply System has an additional CR/RSP requirement in addition to GDC 19 and fire. The flooding analysis for the CR deals with postulated moderate energy line failures of the fire protection and potable water lines. The planned response to a failure of one of these lines is, when required, to evacuate the CR and to control the Plait from the RSP. This action is to mitigate the consequences of water initiated shorts due to the flooding.

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The potential for flooding in the CR exists, and the RCIC design did not adequately transfer RCIC control and power out of the CR in accordance with the WNP-2 requirements. This constitutes a condition alone that could have prevented the fulfillment of a safety function of a system that is needed to maintain the reactor in a safe shutdown condition. This condition is reportable pursuant to the requirements of 10CFR50.73(a)(2)(v).

The root cause of this event was misapplication of design inputs. The requirement to transfer control of RCIC from the CR was recognized, but was improperly implemented. This condition has existed since before initial Plant startup in 1984.

There were no structures, systems, or components inoperable prior to the start of this event that contributed to the event.

Operation of RCIC is not required for safe shutdown in the event of a fire. WNP-2 utilizes the safety relief valves and the Residual Heat Removal System (RHR) for post fire safe shutdown. This shutdown from outside the CR is accomplished primarily at the Remote Shutdown Panel (RSP) and the Alternate Remote Shutdown Panel.

In addition to the requirements for loss of Control Room due to a fire, WNP-2 is designed to meet the requirements of 10CFR50, Appendix A, Criterion 19 (GDC 19), Control Room. This includes the requirement to have equipment located at appropriate locations outside the Control Room to be utilized to bring the Plant to, and maintain the Plant in, a hot shutdown condition. RCIC is one of the systems credited by WNP-2 to meet this requirement.

As described in the Event Description section above, the 48 VDC power supply for the RCIC control system was still routed through the CR when RCIC control was transferred to the RSP. Further evaluation revealed that the position signal for RCIC turbine steam inlet valve, RCIC-V-45, used by the RCIC control system during turbine startup, was also routed through the CR during RSP operation of RCIC. Neither of these conditions affected successful operation of RCIC from the RSP as demonstrated by past testing of RCIC using RSP control.

The design conditions necessary to satisfy the remote hot shutdown GDC 19 requirements are clarified in NUREG 0800, Standard Review Plan. It is stated in section 7.4 that remote shutdown required equipment "should be capable of operating independently (without interaction) of the equipment in the main control room. " The NUREG also states that for those events other than fire that force evacuation of the main control room, "These events would not result in consequential damage or unavailability of systems required for safe shutdown."

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In the discussion of the remote shutdown systems (RSS) in NUREG-0892, Safety Evaluation related to the operation of WPPSS Nuclear Project No. 2, the NRC stated:

The RSS is provided to enable control of the systems needed to bring the reactor to a cold shutdown condition from a location other than the main control room (GDC 19, "Control Room"). The applicant has provided this capability on a remote shutdown panel, where the necessary instrumentation, controls, and control transfer switches are located.

The conditions generally postulated for GDC 19 design are events such as smoke, hazardous chemical spills, etc., which result in a loss of control room habitability. It is the Supply Systems understanding that in order to satisfy GDC 19, those systems required to attain hot shutdown and subsequent cold shutdown must be controllable from remote locations without unacceptable interaction from CR equipment. The conditions identified in this LER did not result in RCIC system control interference from the CR or impact the ability to successfully operate RCIC from the RSP.

B. Further Corrective Action

The 48 VDC power supply for the RCIC control system, and the position signal for valve RCIC-V-45, will be modified so that they are transferred from the CR to the RSP, along with the other RCIC controls, when the RCIC transfer to the RSP is made. These design changes will be completed no later than June 30, 1992.

#### Safety Significance

As stated in the further evaluation section above, the RCIC condition reported in this LER did not impact Plant implementation of the GDC 19 or fire required remote shutdown capabilities. The condition did, however, potentially affect the Plant response to a CR flood.

The flood in the CR would result from a crack of the moderate energy fire protection or potable water lines. A fire protection sprinkler line passes over control panels. These control panels are not designed to prevent water intrusion and thus shorting to ground could result. It was determined that the most effective method for dealing with this postulated pipe crack was to evacuate the CR. This overhead sprinkler pipe, however, is not in a position where water leakage could impact the RCIC controls. In fact, the cables described in this LER are located in a panel in the rear of the CR approximately 60 feet away from the overhead sprinkler piping.

A second concern from flooding is the buildup of water in the cable routing area located under the CR false floor. The area under the CR is approximately 8000 ft<sup>2</sup>. The maximum estimated flow from the fire protection system crack is 24 gallons per minute, while the maximum flow from the potable water system crack is 11 gpm. It has been conservatively estimated that isolation of the fire protection system

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would take no longer than 5 minutes, while shutdown of the potable water system would take no more than 10 minutes. The maximum estimated water leakage into the CR is thus 120 gallons.

Distributed evenly over the sub-floor area, the water depth would be 0.6 mm. This estimation does not take into account the time it might take to discover a leak. Since the piping in question is hidden from view and would not trigger an alarm if a leak occurred, an unknown period of time could pass prior to discovery. The area in question is within the CR boundary, however, and is passed frequently by Plant personnel. It is estimated that no more than 30 minutes would elapse between personnel passing this area.

The 48 VDC power and valve position signal cables in question are Quality Class I and are required to meet strict requirements. These cables should not be affected by short term exposure to water caused by a control room flood.

A flood in the CR is an extremely low probability event. Given the postulated level of water in the control room sub-floor, and the relative location of the subject RCIC cables, the probability of damage to the cables in a flood is also extremely low. This event did not impact the operation of RCIC from the CR. Even if RCIC were lost due to a CR flood, however, the low pressure emergency core cooling systems would have been available and controllable from outside the CR to safely shutdown the Plant. This event had no safety significance.

#### Similar Events

There are no known instances where power or control signals were not transferred out of the CR to the RSP to protect against a CR flood.

#### EIIS Information

#### EIIS Reference

#### Text Reference System Component

Reactor Core Isolation Cooling BN ---  
System (RCIC)  
48 VDC EI ---  
Remote Shutdown Panel (RSP) --- ---  
Alternate Remote Shutdown Panel --- ---  
RCIC Turbine Steam Inlet Valve, BN SHV  
RCIC-V-45  
Main Steam System SB ---  
RCIC Pump BN P  
RCIC Steam Turbine BN TRB  
Reactor AC RCT  
Suppression Pool BT TK  
Condensate Storage Tank KA TK  
Fire Protection Pipe FP PSP  
Potable Water Pipe LV PSP  
Safe Relief Valve SB RV  
Residual Heat Removal System (RHR) BO ---

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

P.O. Box 968 o 3000 George Washington Way o Richland, Washington 99352

May 21, 1992  
G02-92-128

Docket No. 50-397

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U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

SUBJECT: NUCLEAR PLANT WNP-2, OPERATING LICENSE NPF-21  
LICENSEE EVENT REPORT NO. 92-016

Transmitted herewith is Licensee Event Report No. 92-016 for the WNP-2 Plant. This report is submitted in response to the report requirements of 10CFR50.73 and discusses the items of reportability, corrective action taken, and action taken to preclude recurrence.

Sincerely,

J.W. Baker  
WNP-2 Plant Manager (Mail Drop 927M)

Enclosure

cc: Mr. John B. Martin, NRC - Region V  
Mr. C. Sorensen, NRC Resident Inspector (Mail Drop 901A, 2 Copies)  
INPO Records Center - Atlanta, GA  
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